

In re Patent Application of
OLOFSSON ET AL.
Serial No. 09/582,637
Filed: OCTOBER 20, 2000

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REMARKS

By this amendment, independent Claims 34, 46, 49 and 63 have been amended to further clarify the invention. Claims 44 and 45 are cancelled for consistency with the amendments. Claims 34-43 and 46-63 remain pending in the application. Favorable reconsideration is respectfully requested.

I. CONCISE SUMMARY OF THE INVENTION

Referring to Fig. 1 and paragraph Nos. [0025]-[0027] of the present specification, the present invention is directed to an active POTS splitter, method and system including the use of an integrated circuit chip having active splitter circuitry for connecting to a subscriber line to separate analog POTS signals from xDSL signals, and line test circuitry with a unique identity code associated with the active splitter circuitry for transmitting a test signal and the code on the line based upon an event or receipt of a test request signal. The active POTS splitter includes a printed circuit board mounting the IC chip and a line jack connected to the printed circuit board for insertion into a customer premises line socket.

A network operator providing a broadband service, for example xDSL (Digital Subscriber line), must be able to measure certain parameters for a wire pair that is to be used to deliver the service. This is necessary both to ensure that the service can be successfully provided and to enable the network operator to guarantee service quality. There are many advantages if the measurements can be performed on a two sided

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basis. This means that a signal source capable of transmitting test messages/signals, upon request, must be placed at the customer's end of the line. When delivering a broadband service, such as xDSL, without inband POTS, it is necessary to separate the analog POTS signal and the xDSL signal from each other at both the CO (Central Office) and the CP (Customer's Premises). The results of applying a test message/signal to the line at the customer's end are measured at the CO (Central Office) end. The present invention provides an active POTS splitter which includes this testing feature within an integrated circuit chip mounted on a PCB with a line jack.

The present invention provides the incorporation of test functionality for the line between the CP and the CO, or ONU (Optical Network Unit), with an active splitter design implemented on a single chip. This enables two-sided measurements on the line, both during installation and during operation. The measurements are performed at the CO end upon request, or when the test device automatically sends a test message signal. In this way there is no need for field technicians at the CP side. A unique identity code is transmitted to the CO each time a test is started, or on receipt of a request from the CO.

In a typical application of the present invention, a customer calls a Customer Service Department and requests xDSL-service. The CSD tells the customer that they will send him/her a test device, in other words, the active POTS splitter with line testing functionality, to check the quality of the line. When the customer receives the POTS splitter,

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he/she can install it simply by inserting it in the telephone jack socket. It is then possible to perform measurements on the line from the CO. The results of these measurements can then be promptly sent to the customer. It may then be possible to deliver the xDSL service the next day or, alternatively, after some changes are made to the network. The test circuitry and POTS splitter of the present invention can be inexpensively produced.

II. The Claims are Patentable

Claims 34-63 were rejected in view of Cole et al. (U.S. Patent No. 7,006,445) together in various combinations with Dresser (U.S. 5,357,556), Lechleider (U.S. 6,091,713), Bingel (U.S. 6,014,425), Winkler (U.S. 5,870,451), Kennedy (U.S. 5,799,060), Keefe (U.S. 6,005,921), Chan (U.S. 5,974,115) and/or EP 0795977 for the reasons set forth on pages 3-8 of the Office Action. As noted above, independent Claims 34, 46, 49 and 63 have been amended to further clarify the invention, and Claims 44 and 45 have been cancelled. Applicants contend that Claims 34-43 and 46-63 clearly define over the cited references, and in view of the following remarks, reconsideration of the Examiner's rejections under 35 U.S.C. §103 is requested.

The Cole et al. patent is directed to a method for determining the suitability of a copper line, used for transmitting voice band signals and having one or more user devices coupled thereto for transmitting signals on the copper line, for use in transmitting data signals out-of-band with

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the voice band signals is provided. The method includes applying a test signal at one point in the copper line. A response of the copper line to the test signal is monitored, as influenced by the one or more user devices. The approach includes disconnecting at least one of the user devices from the communication line, and repeating the providing, monitoring, and determining steps to determine if the at least one user device disconnected from the communication line is an interfering device.

As shown in FIGs. 1, 4, 5, 7 and 8, for example, the test unit of the Cole et al. approach may be provided at the central office or at the customer's premises. Either way, there is no teaching in Cole et al. that an IC chip includes both splitter circuitry and line test circuitry at all, let alone the IC chip being mounted on a PCB with a line jack for insertion into a socket at the customer's premises.

Each of the independent claims now sets forth that the active POTS splitter comprises an IC chip including both splitter circuitry and line test circuitry, and further sets forth that the IC chip is mounted on a PCB with a line jack for insertion into a socket at the customer's premises. Furthermore, each of the independent claims positively recites that the line test circuitry is located at the location of the customer, and that the test signal is provided for measuring quality parameters relating to xDSL transmission on the subscriber line, as helpfully suggested by the Board of Appeals.

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The Dresser patent is directed to a system and method for testing equipment in a telephone network for remote maintenance and verification of subscriber loops. The system and method accommodate known AC and DC fault testing techniques while providing duplex verification of the subscriber loop identification. The Examiner describes the Lechleider et al. patent as teaching generation of a test signal and identification of a subscriber loop through caller ID or ANI information. The Lechleider et al. patent discloses a logic device that places a telephone call, via a modem at a subscriber's premises, to a distant modem at a qualification center to determine the viability of deploying ADSL over the subscriber line. Again, there is no teaching in either of these references that an IC chip includes both splitter circuitry and line test circuitry at all, let alone the IC chip being mounted on a PCB with a line jack for insertion into a socket at the customer's premises, as claimed.

As the Examiner is aware, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim features. The initial burden is on the Examiner to provide some suggestion of the desirability of doing what the Applicants have done. To support the conclusion that the claimed invention is directed to obvious subject matter,

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either the reference must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the reference. Both the suggestion to make the claimed combination and the reasonable expectation of success must be founded in the prior art and not in Applicants' disclosure.

The other cited references are relied upon by the Examiner to teach the use of various line testing features as discussed by the Examiner in the Office Action. However, none of these references makes up for the deficiencies of the Cole et al., Dresser and Lechleider references as discussed above.

There is simply no teaching or suggestion in the cited reference to provide the combination of features as claimed. Accordingly, for at least the reasons given above, Applicants maintain that the cited references do not disclose or fairly suggest the invention as set forth in Claims 34, 46, 49 and 63.

It is submitted that the independent claims are patentable over the prior art. In view of the patentability of the independent claims, it is submitted that their dependent claims, which recite yet further distinguishing features are also patentable over the cited references for at least the reasons set forth above. Accordingly, these dependent claims require no further discussion herein.

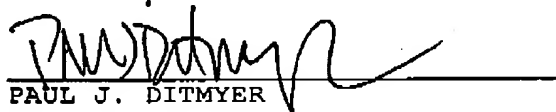
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III. Conclusion

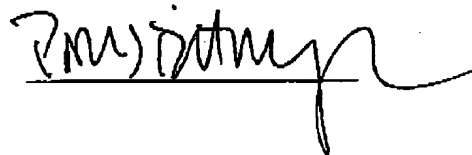
In view of the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. An early notice thereof is earnestly solicited. If, after reviewing this Response, there are any remaining informalities which need to be resolved before the application can be passed to issue, the Examiner is invited and respectfully requested to contact the undersigned by telephone to resolve such informalities.

Respectfully submitted,


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